

Technical Report 1158

**The Interactive Effect of Feedback Sign and Task
Type on Motivation and Performance**

Avraham N. Kluger

The Hebrew University of Jerusalem

Dina Van-Dijk

Ben-Gurion University of the Negev

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Avraham N. Kluger

The Hebrew University of Jerusalem

Dina Van-Dijk, PhD

Ben-Gurion University of the Negev

Research and Advanced Concepts Office

Paul A. Gade, Chief

**U.S. Army Research Institute for the Behavioral and Social Sciences
2511 Jefferson Davis Highway, Arlington, Virginia 22202-3926**

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FOREWORD

The mission of the U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to maximize individual and unit performance and readiness to meet the full range of world-wide Army missions through advances in the behavioral and social sciences. The Army is faced with a dilemma of maintaining behaviors that have served its survival well throughout history and making changes in anticipation of rapidly changing threat situations now occurring in the ongoing and rapid transformation of war. This transformation of war demands new approaches to military problems often referred to as more flexible and adaptable behavior. Survival is threatened by subscribing exclusively to maintaining old military behaviors as well as by experimenting with new, unproven approaches. In this report, Professor Avi Kluger shows us a third way of approaching this dilemma by experimentally showing how we can maintain traditional military behaviors as well as encourage creative behaviors under the appropriate circumstances by the type of feedback we provide the performers of these behaviors. Dr. Kluger's results clearly imply how we might conduct testable, applied research in how we train Soldiers for various tasks critical to the Army's survival in the modern world.



MICHELLE SAMS
Technical Director

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THE INTERACTIVE EFFECT OF FEEDBACK SIGN AND TASK TYPE ON MOTIVATION AND PERFORMANCE

EXECUTIVE SUMMARY

The Army, like many other modern organizations, utilizes performance appraisal systems both for administrative purposes (promotion/demotion decisions) and for developmental purposes (to motivate and to facilitate learning). Yet, a statistical review of the evidence supporting the use of feedback (such as performance appraisal) suggests that providing personnel with feedback is like gambling in the stock exchange: on average, you gain, yet the variance is such that you have a 40% chance of a (performance) loss following feedback (Kluger & DeNisi, 1996). Given this high risk for the Army in using performance appraisal system, the next obvious question is when feedback is helpful and when it is detrimental. An apparently obvious answer is that feedback effectiveness depends on whether feedback is positive or negative. That is because people appear to make an immediate and automatic evaluation of every stimuli (regardless of its informative value) to determine whether it is good or bad for them. Hence, the obvious question is what motivates more, negative or positive feedback (feedback sign)? Again, massive data suggest no simple answer to this question (Kluger & DeNisi, 1996). The current research suggests an answer to this question based on Higgins (1997) theory of prevention-promotion regulatory focus. Results of two experiments indicate that the effectiveness of the feedback sign depends on the regulatory focus induced by the task. Prevention-inducing tasks are tasks that require vigilance and cautiousness (e.g. guarding, security tasks), while promotion-inducing tasks are tasks that require openness and creativeness (e.g. planning battle's strategy, developing new training program). The current results suggest that negative feedback is most effective for prevention tasks, while positive feedback is most effective for promotion tasks.

At the practical level, these findings suggest that no feedback system can fit all. Hence, for performance appraisal system to be effective it must be tailored for specific tasks, occupations, and even personalities (all of which can activate either promotion focus or prevention focus). This insight requires a consideration of a potential performance loss in places where performance gain was intended.

This work also has implication for personnel selection and training. Certain military occupations that largely require high vigilance may be best staffed with Soldiers that have strong chronic-prevention focus. Such occupations may include monitors of radar screens, guards, personnel, etc. These Soldiers' performance may benefit most from training that emphasizes punishment for poor performance and by performance appraisal system that emphasizes error-free performance, and blocks the promotions of Soldiers with records of frequent errors and disciplinary records. In contrast, other military occupations that require a state of eagerness, for example among elite fighting units, may be best staffed with Soldiers that have a strong chronic-promotion focus, and their training and evaluations may best benefit from awards, prizes and recognition of excellence.

In summary, this work has policy implication for personnel management in the Army. A continuation of this project, also supported by ARI, continues to expose additional factors that should be considered in strategic thinking about performance appraisal in the Army.

THE INTERACTIVE EFFECT OF FEEDBACK SIGN AND TASK TYPE ON MOTIVATION AND PERFORMANCE

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INTRODUCTION

Numerous studies have been conducted on the effects of various types of feedback (formal performance appraisals; grades; etc.) on motivation and performance. However, feedback effects on performance range from extremely positive effects through no effect to strong negative effects (Kluger & DeNisi, 1996). It also seems that the feedback sign - whether the feedback is positive or negative - does not explain this large variance in the effects (Kluger & DeNisi, 1996). This inconsistency begs the question of what are the conditions under which positive feedback improves motivation and performance, versus conditions under which negative feedback enhances motivation and performance. Recently, Van-Dijk and Kluger (2004) have made a first step towards answering this question by applying Higgins's (1997) self-regulation theory. Self-regulation theory proposes two distinct states of self-regulation: Promotion focus and prevention focus. Promotion focus involves the tendency to approach positive outcomes, eagerness to attain success and willingness to take risks, while prevention focus involves the tendency to avoid negative outcomes, vigilantly monitoring against failure and risk aversion. Momentary regulatory foci are determined both by individual differences and by situational demands. Situational demands such as the work context, or the kind of task, induce either promotion or prevention focus by emphasizing positive outcomes, success and risk-taking or emphasizing negative outcomes, failure and avoiding risks.

Using these constructs, Van-Dijk and Kluger (2004) suggested that the effect of feedback sign on motivation is moderated by regulatory focus. Specifically, under promotion focus positive feedback increases motivation, while under prevention focus negative feedback increases motivation. Their study is very promising because it showed that individual differences in self-regulation focus - promotion versus prevention -- predict the effect of feedback sign on work motivation. However, their study has some limitations: It used self-reports measures of work motivation as the dependent variable, and it did not measure actual performance. In addition, Van-Dijk and Kluger's study manipulated the situational regulatory focus only by priming participants to view the situation either as promotion or as prevention related, but did not consider the potential powerful role of the task itself in determining regulatory focus.

The purpose of the present research is to expand the test of the interaction of feedback sign with self-regulatory focus. Unlike the vast feedback literature that typically considered one factor at the time, we propose a theory-driven approach that takes into account, both the person and the task as the sources of promotion versus prevention focus. Tasks represent the situational attribute that primes the performer towards a promotion or a prevention focus. Specifically, we sought to test the effect of feedback sign on the performance of a task considered to induce situational promotion focus (creativity task) and the performance of a task considered to induce situational prevention focus (error-detection task). We expect that negative feedback would better support the performance of error-detection tasks, whereas positive feedback would better support the performance of creative tasks. This interaction will be further moderated by individual differences in self-regulation foci, such that the benefit of avoiding failure on error detection tasks will

be most salient for participants with a chronic prevention focus, and the benefit of success on creative tasks will be most salient for participants with a chronic promotion focus.

In this paper, we have three goals: First, we seek to expand the construct of prevention and promotion to characterize different tasks. Specifically, prevention focus can be induced by tasks that address security needs and by tasks that require vigilance against errors; and promotion focus can be induced by tasks that address growth needs and by tasks that require eagerness to discover new possibilities. The fundamental difference between vigilance tasks and eagerness tasks can be understood with the language of signal-detection theory (Higgins, 1997) which sees four types of decisions: correct acceptance (hits), correct rejections, false acceptance, and false rejection. Eagerness tasks (e.g., designing a new approach to war) calls for a bias to ensure maximum hits, at the expense of making false acceptances (to make sure that the best approach will be discovered). In contrast, vigilance tasks (e.g., checking a bomb for safety of use before detonation) calls for a bias in favor of ensuring all correct rejection (alarming in every case of suspected problem to prevent the use of the bomb), at the expense of making a false rejection. Following Higgins (1997),) and linking types of task to regulatory focus, it is possible to generate new predictions based on the interaction between regulatory focus and feedback sign that was found by Van-Dijk & Kluger (2004). Our second goal is to expand regulatory focus theory by advancing a new variant of Maslow's hierarchy hypothesis. Specifically, we will argue that whereas prevention effects are common, the effect of promotion focus manipulations (opportunities in the environment) will influence largely individuals with chronic promotion focus. Thus, a three-way interaction between feedback-sign, situational-regulatory focus (task type), and chronic-regulatory focus is expected: The interaction between feedback-sign and situational-regulatory focus will be significant among the chronic promotion people, but not among the chronic prevention people. Finally, in order to strengthen the external validity of our arguments, our third goal is to demonstrate both the two-way interaction and the three-way interaction effect when measuring actual performance.

To attain our three goals, we first explain the effect of task type on situational-regulatory focus and present hypotheses 1 and 2 (first goal). Then, we will explain the idea of hierarchy between prevention and promotion, and present hypothesis 3 (second goal). Next, we will explain the use of values as a measure of chronic-regulatory focus, and describe in details two experiments that test our hypotheses: In Experiment 1 all three hypotheses will be tested using self-reported measures, and in Experiment 2 hypotheses 2 and 3 will be tested using actual performance measure (third goal).

Task type as situational regulatory focus

Regulatory focus theory (Higgins, 1997; 1998) suggests that there are two regulatory systems: prevention focus and promotion focus. The prevention focus system regulates the avoidance of punishment, handles duties and obligations (oughts) and satisfies security needs, whereas the promotion focus system regulates the achievement of rewards, handles accomplishments and aspirations (ideals) and satisfies nurturance needs and growth needs (Brockner & Higgins, 2001).

Recent findings indicate that prevention and promotion focus lead to different behavior tendencies. Specifically, prevention focus leads to conservative behavior, mistakes avoidance, accuracy (in performance) and vigilance tendency, whereas promotion focus leads to creative behavior, risk taking, speed (in performance) and eagerness tendency (Crowe & Higgins, 1997; Friedman & Forster, 2001; Forster, Higgins, & Bianco, 2003; Liberman, Idson, Camacho, & Higgins, 1999). Taking these different tendencies of behavior into the domain of tasks, we assume that there are certain tasks that require prevention tendencies like vigilance or accuracy, while there are other tasks that require promotion tendencies like eagerness or speed. Therefore, certain types of tasks are more likely to induce prevention rather than promotion focus, and other types of tasks are more likely to induce promotion rather than prevention focus. For example, tasks that require vigilance or avoiding mistakes, like discovering objects on radar screen or detecting errors in firm reports, produce prevention focus, by their nature. In contrast, tasks that require eagerness or creativity, like seeking new ideas or initiating changes in organization, produce promotion focus by their nature.

In sum, we argue that tasks that require vigilance, caution, accuracy or mistakes avoidance will be perceived as prevention tasks and therefore as “oughts” or something that one has to do. In contrast, tasks that require eagerness, openness, fluency of thoughts, or creativeness, will be perceived as promotion tasks and therefore as “ideals” or something that one wants to do. Our first hypothesis then is:

H1: Prevention-type tasks will be perceived as tasks that one “ought” to do, whereas promotion-type tasks will be perceived as tasks that one “want” to do.

The Interaction between regulatory focus and feedback sign

According to Higgins, people experience a “regulatory fit” when their regulatory focus (promotion or prevention) fits their task outcome (positive/reward or negative/punishment), and this regulatory fit increases the value of what they are doing (Higgins, 2000). Negative feedback is an outcome that fits prevention focus, because the prevention system is most concern with avoiding negative outcomes. In contrast, positive feedback is an outcome that fits promotion focus, because the promotion system is most concern with achieving positive outcomes. Based on that, Van-Dijk and Kluger (2004) tested the interactive effect of feedback sign and regulatory focus on motivation. According to their hypothesis they found that under prevention focus negative feedback increases motivation more than positive one, whereas under promotion focus positive feedback increases motivation more than negative one. In this reserach, we expect to find the interaction between regulatory focus and feedback sign when using different task types to induce regulatory focus. Specifically, we expect that negative feedback will contribute to performance of prevention-type tasks more than positive feedback, while the opposite may be true for promotion-type tasks. Consistent with our explanation, Wade (1974) found that instructing people to monitor errors (negative feedback) in a vigilance (prevention) task produced better performance than instructing people to monitor successes. Conversely, if as we suggest, the nature of a task determines regulatory focus, we can predict that negative feedback will be detrimental for performance on tasks that

activate promotion focus. Therefore, we hypothesize a two-way interaction between feedback-sign and situational-regulatory focus on motivation when regulatory focus is manipulated by task type. Our second hypothesis then is:

H2: For prevention-type tasks, negative feedback increases motivation more than positive feedback, whereas for promotion-type tasks, positive feedback increases motivation more than negative feedback.

One might ask what happens when the task is prevention-focused and the person is promotion-focused. We can generalize this question and ask what happens when the situational-regulatory focus contradicts the chronic-regulatory focus? Answering this question is the second goal of our paper and it leads us to the hierarchy hypothesis. Our concept of hierarchy is that prevention focus dominates promotion focus and therefore manipulation of prevention focus will affect most people, while a manipulation of promotion focus will affect mostly the high chronic-promotion people. That is, we all tend to consider safety first, but only few of us can, given appropriate environmental cues, ignore the issue of safety. The hierarchy hypothesis suggests a three-way interaction between feedback sign, situational-regulatory focus and chronic-regulatory focus. Specifically, people who are low in chronic promotion perceive a little difference between prevention and promotion situations. However, people high in chronic promotion perceive a significant difference between promotion and prevention situations. Therefore, the interaction between feedback sign and regulatory focus will be significant among high chronic-promotion individuals, but not among low chronic-promotion individuals.

Prevention/Promotion hierarchy

The idea of hierarchy is derived from Maslow's (1965) need theory. Maslow's deprivation-domination hypothesis suggests that as long as needs lower in the hierarchy are not satisfied, needs higher in the hierarchy are not aroused. This implies that needs low in the hierarchy will dominate behavior, as long as they are deprived. Despite the criticism of Maslow's hierarchy (Wahba & Bridwell, 1976), the deprivation-domination proposition was supported by Wicker, et al (1993) who replaced the traditionally used measures of need-pursuit importance with measures of need-pursuit intention. They also found that negative reactions to non-attainment were relatively larger for goals related to lower needs, and positive reactions to attainment were larger for higher-order needs. These findings indicate that the lower needs are more important and people prefer to satisfy them before they are taking care of the higher needs. Support for the hierarchy principle also came from a study of Freitas, Liberman, Salovey, & Higgins (2002). They found that prevention focus foster preferences to initiate action earlier than does a promotion focus. In their study, people preferred to take care of tasks that were framed as prevention before taking care of tasks that were framed as promotion. Both Freitas et al. (2002) and Wicker et al. (1993) show that people perceive prevention goals as more urgent and in higher priority than promotion goals. Thus, we take a two-tier hierarchy view.

According to our hierarchy proposition, prevention goals will receive priority and be more urgent than promotion goals. This means that in most situations people will be in prevention focus. In contrast, promotion focus will be more rare and will be found usually among people who already fulfilled (or less worried about) their prevention goals. Thus, producing or finding a situation of promotion focus in the laboratory or in life will be much more difficult than producing or finding a prevention focus.

An example of the dominance of prevention focus could be found among University students. Most students are chronically prevention focused regarding their studies. They perceive studying as a prevention goal, a duty, something that one's should do even if it is not always interesting and should avoid failure in this goal. Based on this assumption, Van-Dijk and Kluger (2000) predicted that most students would perceive studying in a course as a prevention goal, regardless of whether the course is required (prevention) or is an elective (potentially promotion). However, students who are chronically in a promotion focus would perceive their studying task as something that they want to do but do not have to do. Thus, these students will perceive an elective course as a promotion goal. Following this assumption, Van-Dijk and Kluger (2000) divided a group of 153 students into high (e.g., philosophy), moderate (e.g., sociology), and low (e.g., accounting) chronic promotion, by their area of studies. A three-way interaction supported their hierarchy hypothesis. Specifically, a significant crossover two-way interaction between feedback-sign and course type (required or elective) was found only among students high in chronic promotion focus: Positive feedback induced more motivation (than negative feedback) in the elective course, and negative feedback induced more motivation (than positive feedback) in the required course. Among students who are low in chronic promotion, there was only a main effect for feedback such that failure motivated more than success regardless of the course type. The group classified as moderate in promotion focus yielded an interaction but not a cross over interaction. That is, failure motivated them more than success, but the elective course attenuated this effect.

In sum, the hierarchy hypothesis suggests that the effect of prevention focus is common and frequent, while the effect of promotion focus is rare and more difficult to obtain. This hypothesis will be expressed in a three-way interaction between feedback-sign, situational-regulatory focus, and chronic-regulatory focus. Based on our previous hypothesis (H1) that task type creates situational-regulatory focus, the situational-regulatory focus will be measured by task type:

H3: For people high in chronic-promotion focus, motivation increases after positive feedback in creative task and after negative feedback in error-detection task. However, for people low in chronic-promotion focus, motivation increases after negative feedback both in creative and in error-detection tasks.

Next, we explain why values' profile could be use to measure chronic-regulatory focus.

Values as chronic regulatory focus

One way to measure chronic-regulatory focus is by values. Schwartz (1992) presented a "values map" and suggested that one out of two basic dimensions of values is Conservation - Openness to change (security, tradition and conformity vs. self-direction and stimulation values). Liberman, et al. (1999) provided support for the connection between those values and regulatory focus by showing that promotion focus relates to openness to change, and prevention focus relates to conservation (preference for stability). Based on Liberman, et al (1999) findings, Van-Dijk and Kluger (2004) have used values as a measure of chronic-regulatory focus. They found that people high on conformity and security values (chronic prevention) reported higher motivation after negative feedback, while people high on self-direction and stimulation values (chronic promotion) reported higher motivation after positive feedback. These recent findings strengthen the argument that chronic-regulatory focus can be measured through values.

Parenthetically, our proposal to use Schwartz's values as an index of chronic regulatory focus exposes a thorny issue regarding Higgins theory. Specifically, Schwartz proposed a conflict between constructs (e.g., security values and self-direction values) that we suggest reflect promotion and prevention, whereas Higgins's work suggests that prevention and promotion are orthogonal. This conceptual disagreement can be resolved if one assumes that promotion and prevention foci operate in two modes: monitoring stage and action stage of behavior (Avila, 2001). It is possible that promotion and prevention are orthogonal during the monitoring stage and mutually exclusive during the action stage. For example, an officer may both monitor prevention goals and promotion goals while touring a platoon by searching for safety violations (prevention) and thinking about a better way to arrange tasks for the unit (promotion). However, once noting a safety hazard, the officer is likely be engaged in behavior totally under the control of the prevention system. Therefore, while at any given moment the activation of one system is likely to shut off the other system, the overall performance of complex tasks may be influenced by the operation of a varying mixture of the prevention and the promotion systems. In some tasks and occupations, the majority of activities will be best performed under promotion focus (creative); and in other tasks and occupations, the majority of activities will be best performed under prevention focus (safety). The putative semi-independence of the promotion and prevention focus can reconcile the question of whether promotion and prevention are orthogonal or bi-polar. Specifically, the negative correlations found between values in opposite sides of the value circle may indicate bi-polarity in action, whereas the independence of other putative measures of promotion and prevention may indicate that they are orthogonal during monitoring. This proposal is very similar to current thinking about the affect system (Cacioppo, Gardner, & Berntson, 1999) where typically approach and withdrawal behaviors are reciprocally activated in overt behavior, but are assumed to stem from two independent systems. Typically, one system dominates behavior, but when both systems are activated, people experience intense ambivalence or conflict. Thus, the apparent difference between Higgins' formulation on one hand and Schwartz can be reconciled, but it is beyond the scope of this research (but see Kluger & Ganzach, 2004).

Experiment 1 conducted in order to test hypotheses 1-3. The Experiment was divided into two parts. The first part included a judgment task in which participants had to decide, for different tasks, whether they are "ought" tasks or "want" tasks. In the second part of the experiment, the participants received a scenario in which task type and feedback sign were manipulated. In the end of the scenario they were asked to rate their intention to exert effort on the task.

Experiment 1

To test our first hypothesis we created a list of tasks that represent the different aspects of prevention and promotion. The aspects that we chose were security versus nurturance needs (Higgins, 1997), accuracy versus creativeness (Crowe & Higgins, 1997; Friedman & Forster, 2001; Forster, Higgins, & Bianco, 2003), stability versus change (Liberman, et al, 1999), and conservative versus risky tendency (Crowe & Higgins, 1997). We hypothesized that the prevention-type tasks will be perceived as tasks that one ought to do, whereas the promotion-type tasks will be perceived as tasks that one wants to do.

To test hypotheses 2-3 regarding the two-way and the three-way interaction effects, we chose two representative tasks from the tasks list. One task was chosen from the prevention type tasks – error detection, and the other task was chosen from the promotion type tasks – ideas generation. For each task, we created a scenario that describes working on that task and receiving either negative or positive feedback. In addition, we measured values to assess chronic regulatory focus. We predicted that in the error-detection scenario (prevention focus) people would report higher motivation after negative feedback, while in the ideas-generation scenario (promotion focus) people will report higher motivation after positive feedback (a two-way interaction between feedback sign and situational regulatory focus). Furthermore, we predicted that this two-way interaction would be stronger among people high in self-direction values (high chronic promotion) compare to people low in self-direction (three-way interaction between feedback sign, situational regulatory focus and chronic regulatory focus).

Method

Participants

A total of 173 graduate students of Business Administration (two classes, N=87) and Health Systems Management (two classes, N=86) at Ben-Gurion University, volunteered to answer a questionnaire during class time. Most were working students employed either by the Israel Defense Force or in one of the public health services in Israel. The sample included 92 male and 78 female, (three did not mention their gender). The average age was 33.2

Instruments

Prevention/promotion tasks. The respondents received a general explanation on "promotion tasks" versus "prevention tasks". The explanation (translated from Hebrew)

was "During our day-to-day life we perform different types of tasks". In front of you is a description of two types of tasks that people usually perform. Read carefully the description of the two types of tasks. The first type is "ought" tasks, which people perform out of a sense of responsibility and obligation. Sometimes people feel that they have to do something and this is their obligation to do it. This type of tasks is usually performed out of duty, necessity or need. A second type of tasks is "want" tasks, which people perform out of a sense of will and eagerness. Sometimes people feel that they desire to do something, and this is something that interests them. This type of tasks is usually performed out of desire and interest".

After reading the description, the respondents were asked to fill out a questionnaire that contained a list of ten tasks (five prevention-tasks and five promotion-tasks, in mixed order). For each task, they were asked to rate the extent to which they perceive this task as "ought" and the extent to which they perceive this task as "want" on a five-point scale. The five prevention tasks were safety project, errors detection, meeting deadlines, bookkeeping, and maintaining cleanliness. The five promotion tasks were career-development project, ideas generation, creative task, initiate changes, and taking risks.

Chronic-regulatory focus. Chronic-regulatory focus was measured as in Van-Dijk and Kluger (2004), with self-direction and stimulation values measured by the Schwartz's Portrait Questionnaire (Schwartz, Lehmann, & Roccas, 1999). A scale constructed from seven-value items yielded an alpha of .74. An example item was "Thinking up new ideas and being creative is important to me. I like to do things in my own original way". This operationalization of chronic-regulatory focus yielded theoretical consistent results also in the domain of probability estimation (Kluger, Stephan, Ganzach, & HersHKovitz, 2004). For a discussion regarding the difficulties associated with measuring chronic-regulatory focus and the rationale for relying on values, see Van-Dijk and Kluger (2004). To facilitate interpretations, self-direction scores were subjected to a median-split. Norms for the Israeli population are not available and hence the meaning of low and high chronic promotion is relative (within the sample). Results with chronic-self regulation as a continuous variable were virtually identical.

Situational-regulatory focus and feedback sign. When participants completed the prevention/promotion tasks list and the chronic-regulatory focus measure, they randomly received one of four-version scenario. In the scenario, they were asked to imagine that they were working on a project and that their supervisor commented on their task-performance. Two levels of regulatory focus (prevention-task, promotion-task) and two levels of feedback sign (negative, positive) were manipulated in the scenario. Prevention-task was manipulated by asking half of the respondents to imagine that they were assigned to handle a project that aimed to discover errors in the organization's functioning. The respondents had been told that this project requires carefulness, accuracy and attention to details. Promotion-task was manipulated by asking half of the respondents to imagine that they were assigned to handle a project that aimed to generate ideas for the organization's development. The respondents had been told that this project requires creativeness, innovation, and non-routine work. Feedback sign was manipulated by telling respondents

that after one month they have learned that "thus far" their project was either failing or succeeding.

Motivation (intention to exert effort). Motivation was assessed with a one-item question: "Relative to your effort in this project thus far, how much effort are you intending to exert next?" Respondents were provided with an eleven-point scale ranging from "much less" (anchored with -5) through "about the same" (0) to "much more" (anchored with 5).

Procedure

One of the authors entered each of the classes in the beginning and asked students to fill in a questionnaire. Most of the students (about 95%) agreed to answer the questionnaire. The author then waited and gathered all the questionnaires after 15 to 20 minutes.

Results and discussion

To test our first hypothesis, we performed a series of t-tests for paired observations. As predicted, in all five prevention tasks, the average "ought" rating was significantly higher than the average "want" ratings, and in three out of five promotion tasks, the average "want" rating was significantly higher than the average "ought" rating. Two promotion tasks - career development and taking risks - did not yield significant difference between "want" and "ought". Results of the t-tests are summarized in Table 1 (in each comparison there is a different N because of errors in filling out the questionnaire; for example participants that for certain task did not fill both "ought" rating and "want" rating, were dropped from this comparison).

Table 1. Task ratings on "ought" and "want" scales: Means, standard deviations for N, standardized difference (d), and correlations (r).

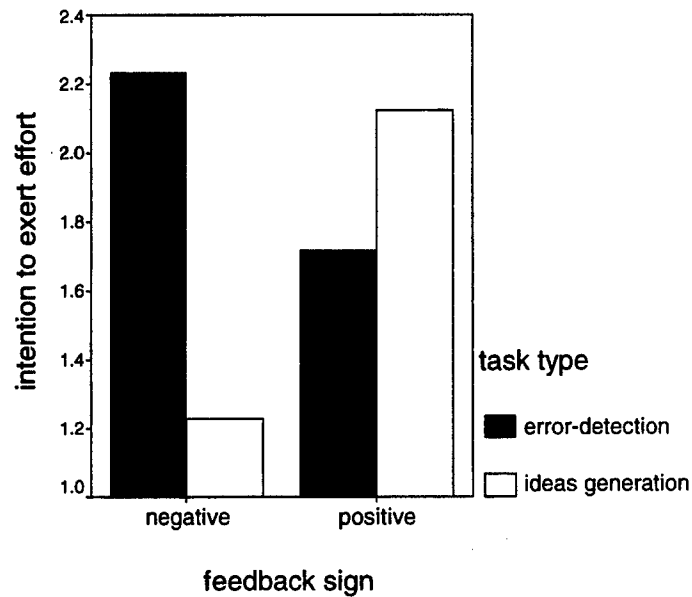
Task	Ought		Want		N	d		$r_{\text{want-ought}}$	
	M	SD	M	SD					
Promotion tasks									
Creative task	3.00	1.00	4.40	0.87	167	-1.49	**	-0.03	
Ideas generation	3.52	1.17	4.31	0.84	168	-0.77	**	0.07	
Initiate changes	3.54	1.02	3.90	1.01	168	-0.35	**	-0.27	**
Taking risks	3.23	1.03	3.16	1.17	166	0.06		-0.23	**
Career-development	3.80	0.87	3.80	1.03	169	0.00		-0.02	
Prevention tasks									
Maintaining-cleanliness	4.16	0.91	3.54	1.12	169	0.60	**	0.15	*
Errors detection	4.20	0.83	3.26	1.16	169	0.93	**	0.04	
Meeting deadlines	4.44	0.66	3.23	1.15	169	1.29	**	-0.06	
Safety	4.36	0.88	2.80	1.14	167	1.53	**	0.04	
Bookkeeping	4.42	0.87	2.32	1.12	162	2.09	**	-0.10	

Note: d is based on formulae for independent samples. Typically, d for paired observations is inflated by positive correlations (Cortina, 2002). However, given that most correlations here are negative and small, we report the uncorrected d's as a conservative approach aimed at demonstrating the ease of obtaining strong effects of task type on regulatory focus. * $p < .05$ and ** $p < .01$, one-tailed.

To test the two-way and the three-way interactions hypotheses, we analyzed the scenario results (two participants did not fill out the scenario). We performed a three-way ANOVA on the motivation measure, with feedback sign, task type and self-direction as independent variables, using the most conservative method (Cohen & Cohen, 1975). That is, we used a hierarchical regression entering first the main effects, second all the two-way interaction effects (H2), and last the three-way interaction effect (H3). No main effect was found for feedback sign, task type, and self-direction ($F(1,163) = .34, p > .50$; $F(1,163) = .72, p > .40$; $F(1,163) = .36, p > .50$, respectively). As predicted there was a two-way interaction between feedback sign and task type ($F(1,163) = 4.44, p < .05$). The pattern of this interaction was in the predicted direction, as can be seen in Figure 1. In the error-detection task negative feedback increases intention to exert effort (more than

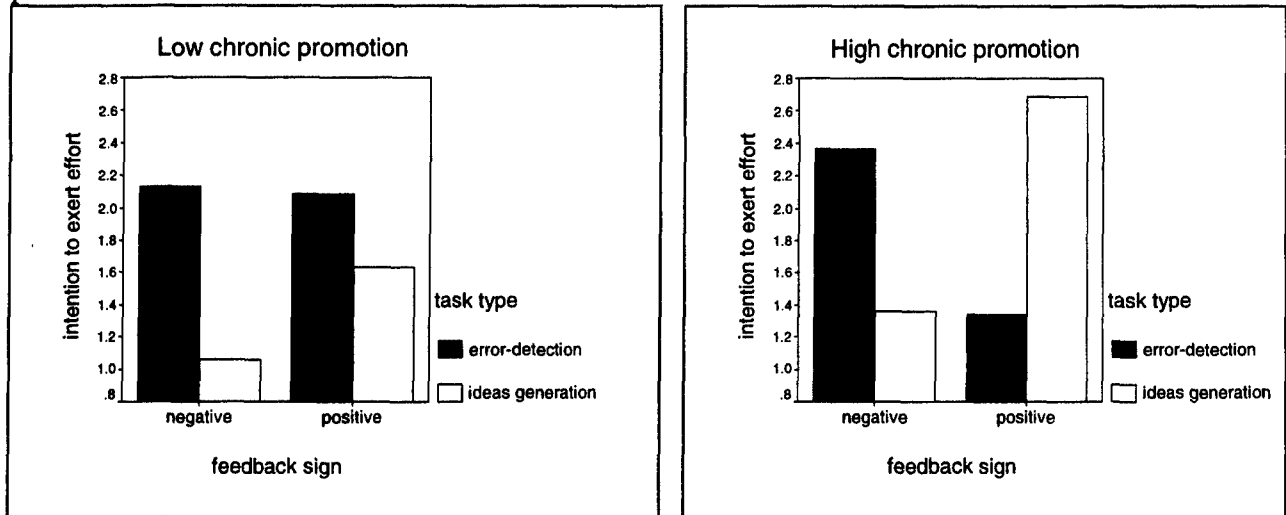
positive one), while in the creative task positive feedback increases intention to exert effort (more than negative one).

Figure 1. Experiment 1: Intention to exert effort by feedback sign and task type.



However, the predicted three-way interaction (hierarchy hypothesis) was not obtained ($F(1,163)= 1.48, p>.20$). Yet, when we split the sample to high versus low chronic promotion focus (self-direction values), the two-way interaction of feedback sign and task type became non-significant among the low chronic promotion, and significant among the high chronic promotion as anticipated by our hierarchy prediction, figure 2.

Figure 2. Experiment 1: Intention to exert effort by feedback sign, task type, and chronic promotion focus.



Further support for the hierarchy hypothesis was found in an additional analysis of the first judgment task. When splitting the sample into high and low chronic promotion, we found that the two groups did not differ in their mean-ought ratings ($M=3.84$ for high chronic promotion, and $M=3.83$ for low chronic promotion), but they largely differ in their want-ratings ($M=3.61$ for high chronic promotion, and $M=3.29$ for low chronic promotion). Moreover, the high and low chronic promotion groups did not differ in their mean ratings (ought and want) of the prevention-tasks ($M=3.69$ for the high chronic promotion, and $M=3.60$ for low chronic promotion), but significantly differ in their mean ratings of the promotion-tasks ($M=3.77$ for high chronic promotion, and $M=3.51$ for the low chronic promotion). This additional analysis is summarized in Table 2.

Table 2. Experiment 1: Overall scales: Means, Standard Deviation, and t-tests comparing high versus low chronic promotion (self-direction values) participants

Measurements	Low chronic promotion (n=88)		High chronic promotion (n=81)		t	
	M	SD	M	SD		
Ought-ratings	3.83	4.71	3.84	4.18	-.197	
Want-ratings	3.29	6.75	3.62	4.82	-3.58	**
Prevention-tasks ratings	3.60	5.00	3.69	4.17	-1.24	
Promotion-tasks ratings	3.52	5.14	3.77	4.24	-3.44	**

Note: df's =167, ** $p < .01$, two-tailed

In summary, the results of Experiment 1 show that certain type of tasks (e.g. error-detection, bookkeeping, safety) are perceived as “prevention tasks” while other type of tasks (e.g. idea generation, creative task) are perceived as “promotion tasks”. Moreover, in each of the two task types, people estimate that they will behave differently in reaction to feedback-sign. Specifically, under promotion tasks people estimate that they will increase their effort following positive feedback, while under prevention tasks people estimate that they will increase their effort following negative feedback. These results are consistent both with Higgins’s regulatory focus theory (1997) and Van-Dijk & Kluger (2004) findings. The Results of Experiment 1 do not fully support the hierarchy hypothesis. Yet, from both the judgment task and the scenario task, it is clear that under prevention focus there is little differences between low versus high chronic promotion, whereas under promotion focus there were much more differences in the behavior of low versus high chronic promotion. This tendency supports the hierarchy hypothesis.

Experiment 2 was conducted in order to test Hypotheses 2 and 3 with actual performance measure.

Experiment 2

Method

Participants

A total of 153 undergraduate students from various departments at the Hebrew University participated in the experiment (77 students in the error-detection task and 76 students in the creative task). However, because of some missing data in the performance of the creative task, some of the analyses include only 143 participants.

Instruments

Chronic-regulatory focus was measured as in Experiment 1.

Situational-regulatory focus was operationalized with task types. In the error-detection task, participants received a list of simple arithmetic exercises with their solutions. They have been told that the solutions contained errors and were asked to find these errors. In the creative task, participants received a description of a cellular-phone company and were asked to create a homepage for this company (using Power Point software).

Performance. Performance on the error-detection task ($N=77$) was measured by number of correct answers (solutions that were identified by the participant as errors and were actual errors) minus number of errors (solutions that were identified by the participant as errors and were in fact correct solutions). Performance on the creativity task ($N=67$) was measured by two independent judges who scored the homepages (on a one to ten scale) for qualitative criteria as creativity, aesthetic, and the use of the software possibilities. The correlation between the judges' ratings was .67. Their ratings were averaged. The scores of both tasks were converted into z-scores separately for pre-feedback and post-feedback.

Manipulation check. To check whether the tasks induced the putative motivational focus, we presented 4-item questionnaire regarding task enjoyment, interest, challenge, stress, and desire to continue, which yielded an alpha of .86.

Procedure

The experiment was conducted by one of the authors and one assistant. Participants were randomly assigned to work on either the creativity task (which was held in a computers' room) or the error-detection task (which was held in a regular classroom). In both conditions, upon arrival to the laboratory participants received a general explanation about the purpose of the research. Next, they were asked to answer the value questionnaire. Then, participants were instructed in performing their assigned tasks and were allowed to work for ten minutes. In both tasks conditions, after ten minutes of work participants were stopped, and asked to leave the experimental room for ten minutes and to fill out a motivation questionnaire (manipulation check) while waiting outside. At this time, the experimenters distributed bogus feedback forms. Half of the forms indicated

"until now your performance is low" (negative), while the other half indicated "until now your performance is high" (positive). When the feedback for all participants was ready, the participants were asked to return, read their feedback and resume work until finishing their task. Upon task completion, all participants were debriefed. The experimenters interviewed all the participants in the negative feedback condition to guarantee that all understood that the feedback manipulation was contrived, and that their performance had no relationship to the feedback received. The entire procedure was approved by the ethics in research committee of the Business School at the Hebrew University in compliance with the Hebrew University regulation regarding research that involves humans.

Results

The manipulation check indicated that the idea-generation task was perceived as more enjoyable and as inducing more interest than the error-detection task. The results of the manipulation check are in Table 3.

Table 3. Experiment 2: Manipulation-check measures: Means, Standard Deviation, and t-tests comparing error-detection versus creative task groups.

Measurements	Error detection task (n=77)		Creative task (n=76)		t	
	M	SD	M	SD		
Task enjoyment	2.87	1.43	3.87	1.00	-	*
					5.01	*
Task interest	2.69	1.45	3.91	1.03	-	*
					5.97	*
Task challenge	3.21	1.35	3.53	1.04	-	
					1.63	
Like to continue	2.96	1.43	3.32	1.22	-	
					1.66	

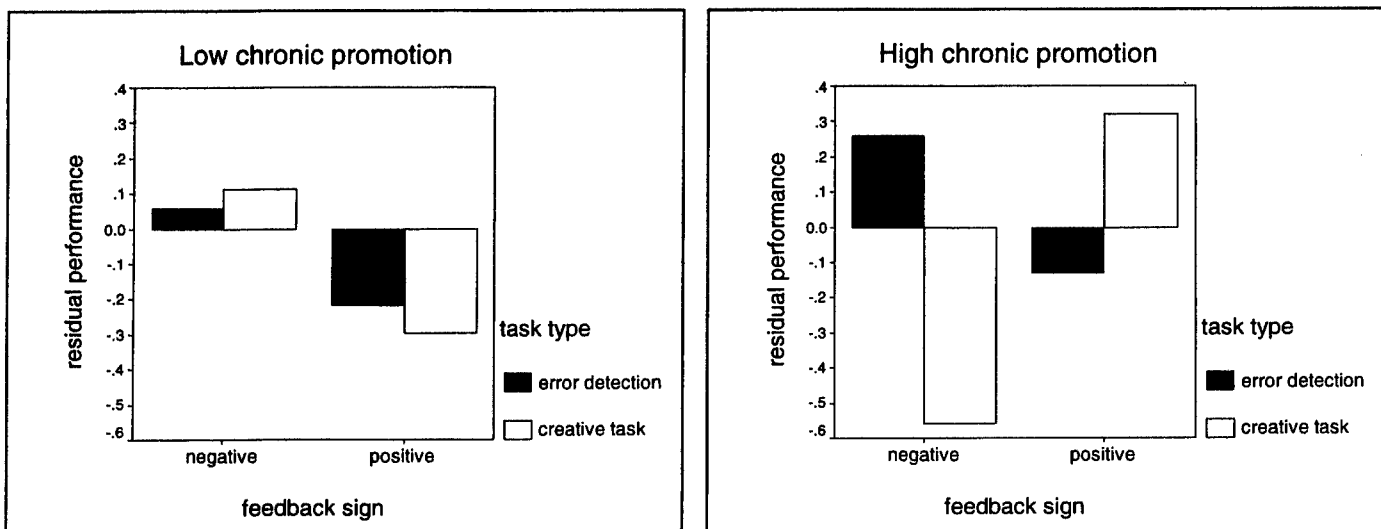
Note: df's =167, ** p < .01, two-tailed

To test our hypotheses, we performed a three-way ANOVA on the residual performance scores (post-feedback performance predicted by pre-feedback performance; the residual scores were used as indicators of performance change). The three independent variables were feedback sign, task type (situational-regulatory focus) and self-direction (chronic-regulatory focus). There were no main effects for feedback sign, task type, and self-direction ($F(1,136)=.12, p>.50$; $F(1,136)=.50, p>.40$; $F(1,136)=.17, p>.50$; respectively). As predicted, the two-way interaction between feedback sign and situational-regulatory focus (task type) was significant ($F(1,136)=4.00; p<.05$). This interaction effect indicates that in the error-detection task, performance was higher after a negative feedback than positive feedback, whereas, in the idea-generation task, performance was higher after a positive feedback than negative feedback. A second two-way interaction between feedback-sign and chronic-promotion focus (self-direction

values) was also significant ($F(1,136)=4.30$; $p<.05$). This interaction effect indicated that for low chronic-promotion people, performance was higher after a negative feedback than positive feedback, whereas, for high chronic-promotion people, performance was higher after a positive feedback than negative feedback. While this two-way interaction was not part of the aims of this research, it replicated previous findings (Van-Dijk & Kluger, 2004).

Finally, as predicted (hypothesis 3), the three-way interaction between feedback sign, task type and chronic-promotion focus was significant ($F(1,136)=6.13$, $p<.05$). The three-way interaction is presented in Figure 3. The direction of the interaction shows that there is a clear interaction between feedback sign and task type only among the high chronic-promotion people. In contrast, among the low chronic-promotion people there was no interaction effect.

Figure 3. Experiment 2: Performance residuals scores (post feedback performance predicted by pre-feedback performance) by feedback sign, task type and chronic-promotion (measured by values).



To confirm that the source of the three-way interaction was a strong two-way interaction among participants with high chronic promotion (self-direction values), we checked the two-way interaction between feedback-sign and task type among the group of high chronic promotion and the group of low chronic promotion separately. As expected, the source of the three-way interaction was the two-way interaction among the high chronic promotion participants. Specifically, for high chronic-promotion participants, there was a significant interaction effect between feedback sign and task type ($F(1,63)=12.14$, $p<.01$). In contrast, for low chronic-promotion participants there was no interaction effect ($F(1,73) = .10$, $p>.70$).

Finally, an alternative analysis of these data yielded practically the same conclusions. Instead of using performance residuals we ran a mixed four-way ANOVA with pre and post feedback performance as a within subject factor and feedback sign, task type, and

self-direction (dichotomized) as between subject factors. For example, the four-way interaction was significant ($F(1,136) = 4.86; p < .05$). We reported above the results with the residuals because they are easier to visualize.

General Discussion

Our findings contribute to two different streams of research: regulatory focus theory and the effects of feedback. Our contribution to regulatory focus theory is the expansion of the concept "regulatory focus" to different task types. We showed that different types of tasks might also serve as cues that induce different regulatory foci. Based on recent findings of Higgins and his colleagues (Crowe & Higgins, 1997; Friedman & Forster, 2001; Forster, Higgins, & Bianco, 2003; Liberman, Idson, Camacho, & Higgins, 1999), we divided a list of tasks to "promotion tasks" (career development, idea generation, initiate changes, creative task, taking risks) and "prevention tasks" (bookkeeping, errors detection, meeting deadlines, safety project, maintaining cleanliness). Then, in a simple judgment assignment, we showed that there is a strong agreement among people with our pre-division. All five prevention-tasks were perceived more as "ought" than "want", while three out of five promotion-tasks were perceived more as "want" than "ought". Two promotion-tasks did not yield a significant differentiation between "ought" and "want" - the task of career development, and taking risks. Further discussion with the participants revealed that the reason was that most of them worked in public organizations in Israel where handling employee-career development is perceived as one of the organization's duties towards its employees. Regarding the task of "risk taking", participants explain that they do not like to take risks, but they understand that the organization "must" take risks. The moderate agreement on the promotion-tasks, compare to the strong agreement on the prevention-tasks is consistent with our hierarchy hypothesis. The hierarchy hypothesis suggests that prevention focus is more common tendency, and it reflects basic needs for most people. Thus, most people will agree on "what is necessary to do" (prevention tasks); while there will be less agreement on "what is desirable to do" (promotion tasks).

Our contribution to feedback research is the explanation for the complex effect that feedback sign is likely to have on performance. It points out to an interesting phenomena related to negative feedback. Our findings suggest that under prevention focus negative, but not positive, feedback would best enhance performance (the interaction effect). Yet, vast literature has documented that debilitating effect of negative feedback on self-efficacy and as a result on performance. These conflicting effects of negative feedback under prevention focus might be explained by two motivational processes. Negative feedback under prevention focus simultaneously increases the value of future success and decreases the expectancy of future success (Levontin, Van-Dijk, & Kluger, under review; Van-Dijk & Kluger, 2001).

One more contribution that still needs further research is the hierarchy effect. We suggested that prevention focus is more common than promotion focus, and therefore, promotion focus will be more difficult to find or induce. As a consequence of the hierarchy effect, we are expecting to find the interaction between feedback-sign and regulatory focus mainly among people with high chronic promotion (for people low in chronic promotion, most situations will be perceived as prevention-type). Our hierarchy

hypothesis was supported strongly by Experiment 2, but got only weak support in Experiment 1. One explanation of the difference between Experiment 1 and Experiment 2 could be that tasks described in scenarios cannot elicit enough differences between the two groups of chronic-regulatory focus. In sum, more research should be done on the hierarchy between prevention and promotion focus.

Yet, note a similarity between our hierarchy argument and the job characteristics model (Hackman & Oldham, 1976). We argue that positive feedback would motivate only individuals high in chronic-promotion focus. Similarly, Hackman and Oldham (1976) suggested that enriching one's job would motivate largely individuals high in growth needs strength -- a construct that is similar to self-actualization need and promotion focus. Specifically, given situational promotion cues, only individuals with chronic promotion focus would respond to a given opportunity. Indeed, the results of a meta analysis (Fried & Ferris, 1987) show that the uncorrected correlation between the motivating potential of a job (enriched job) and performance for people low in growth needs strength is .11, but .35 for people high in growth need strength. These findings are consistent with our hypothesis that people high in chronic promotion focus are especially likely to respond to opportunities in order to fulfill promotion goals.

At the practical level, our findings suggest that no feedback system can fit all. That is, certain military occupations that largely require high vigilance may be best staffed with Soldiers that have strong chronic-prevention focus (which may be measured by values, vocational interests, and perhaps with components of the Big 5 such as conscientiousness). Such occupations may include monitors of radar screens, guards, maintenance personnel, etc. These Soldiers performance may benefit most from training that emphasizes punishment for poor performance and by performance appraisal system that emphasizes error-free performance, and blocks the promotions of Soldiers with records of frequent errors and disciplinary records. In contrast, other military occupations that requires a state of eagerness, for example among elite fighting units, may be best staffed with Soldiers that have a strong chronic-promotion focus, and their training and evaluations may best benefit from awards, prizes and recognition of excellence.

Importantly, the potential application of our recommendation would be relatively easy to implement. The manipulation of veridical feedback so it is perceived either as negative or positive can be achieved with framing. Indeed, recent review of framing effects suggests that messages can be easily framed by emphasizing either the half-full glass or the half-empty glass (Levin, Schneider, & Gaeth, 1998). These general findings are consistent with Wade (1974) who had specifically shown framing effects regarding feedback. Using this ease of manipulation, we recommend emphasizing the negative aspects of performance when the behavior in question is about prevention. For example, a tank maintenance task should be monitored by the number of problems found in the inspection of the tank, and not by the number of problem-free tanks successfully maintained. In contrast, when monitoring training of officer cadets being instructed in suggesting a battle plans, performance should monitor the number of excellent ideas generated by the trainees rather than monitoring the number of poor ideas.

This research enables us to recommend which feedback sign would be most effective for Soldiers with a promotion focus versus Soldiers with a prevention focus; It allows recommending which feedback sign would be most effective for tasks that prime a prevention focus versus tasks that enhance a promotion focus. Finally, the research allows recommending the most effective combination of feedback sign, personal promotion or prevention focus, and task type.

In many cases, Soldiers and officers need to switch from one task to another during the same operation. The question is how to help them change their regulatory focus, to fit it with the task type. This research could offer guidelines for shaping the instructions for performing each one of the tasks, for the type of feedback on performance of the two tasks, and for the structure the reward system. For example, punishment for failure to prevent errors, but no praise for detecting errors, and praise for succeeding in creative tasks, but no punishment for doing poorly on these tasks.

One question that remains open in this research is does promotion focus increase creative performance. According to Higgins (1997), the processing style elicited by promotion focus may enhance creative thought, and that elicited by prevention focus may undermine creative thought. This assumption was recently supported by empirical data (Friedman & Forster, 2001; Crow & Higgins, 1997). Crow & Higgins (1997) found that when generating any number of alternatives is correct, those in a promotion focus generate more distinct alternatives, and those in a prevention focus are more repetitive. In a more direct examination of the effect of regulatory focus on creativity, Friedman & Forster (2001) found that both promotion cues and promotion chronic disposition increase creativity. However, in our research individual differences in chronic regulatory focus (measured by values) did not affect creative performance in the creative task. This inconsistency can be explained by the differences in the task type that have been used in the different studies. Crow & Higgins (1997) used characteristic listing task and sorting task, while Friedman & Forster (2001) used the Snowy Picture Test, and the Gestalt Completion Test. All the tasks that they have been used had quantitative performance (e.g. number of alternatives), while our creative performance in the creative task was measured by qualitative measures as well as quantitative measures, and the task itself was more complicated and ambiguous. Thus, the main effect of promotion and prevention focus on creativity requires more studies.

In summary, this research enables us to predict which feedback sign would be most effective for tasks that prime a prevention focus versus tasks that enhance a promotion focus. Moreover, it allows predicting which feedback-sign would be most effective for employees with a promotion focus versus employees with a prevention focus. Finally, this research allows the design of an effective feedback intervention considering the combination of feedback sign, task type, and individual differences.

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APPENDIX

Error-detection task

Instructions: In front of you, there are mathematic exercises with their solutions. You should check the exercises and find the errors that had fallen in some of them. Mark the exercises that have errors. You do not have to correct the error.

- | | |
|----------------------------------|--|
| 1. $(-7)+(+3)+(-7)+(+2)=-9$ | 16. $(+7)-(+9)=(+7)+(-9)$ |
| 2. $(-1)+(+3)+(+7)+(+1)=12$ | 17. $(+2)-(+3)=(-2)+(+3)$ |
| 3. $(-5)+(-5)+(+5)+(+5)=10$ | 18. $(+8)-(-5)=(+8)+(-5)$ |
| 4. $(-4)+(+7)+(+3)+(-6)=0$ | 19. $(+2)-(+3)=(+2)+(-3)$ |
| 5. $(-7)+0+(-8)+(+1)=-14$ | 20. $(-5)-(-2)=(+5)+(+2)$ |
| 6. $0+(-4)+(-5)+(+4)=-5$ | 21. $(+0.6)-(-0.8)-(+0.7)=0.9$ |
| 7. $(-23)-(+9)=-14$ | 22. $(+29)-(-12)+(-56)-(+7)=-22$ |
| 8. $(-23)-(-9)=32$ | 23. $(-25)-(-42)-(+35)+(-33)=-51$ |
| 9. $(+57)-(+18)=35$ | 24. $(-0.45)-(-0.35)-(+0.65)=0.45$ |
| 10. $(+65)-(-7)+(-45)-(-3)=30$ | 25. $(+5.5)-(-4.5)-(+7.4)+(-5.8)=-3.2$ |
| 11. $(-15)-(+5)-(-73)+(-84)=-31$ | |
| 12. $(-25)-(-5)+(-43)+(+25)=-48$ | |
| 13. $(+17)-(+9)-(-29)+(-36)=1$ | |
| 14. $(-17)-(+9)-(-21)+(-34)=-38$ | |
| 15. $(+8)-(-3)=(+8)+(+3)$ | |

$$\begin{array}{r} 26. \quad =21 \\ 1995 \overline{) 95} \\ \underline{190} \\ 95 \\ \underline{95} \end{array}$$

$$\begin{array}{r} 31. \quad 670 \\ \quad \times 50 \\ \hline \quad 000 \\ 3350 \\ \hline =33500 \end{array}$$

$$\begin{array}{r} 36. \quad 758 \\ \quad \times 91 \\ \hline \quad 758 \\ 6822 \\ \hline =68978 \end{array}$$

$$\begin{array}{r} 41. \quad =922 \\ 122493 \overline{) 133} \\ \underline{1197} \\ 279 \\ \underline{266} \\ 266 \\ \underline{266} \end{array}$$

$$\begin{array}{r} 27. \quad =457 \\ 10488 \overline{) 23} \\ \underline{92} \\ 128 \\ \underline{115} \\ 138 \\ \underline{138} \end{array}$$

$$\begin{array}{r} 32. \quad 219 \\ \quad \times 15 \\ \hline \quad 1095 \\ 219 \\ \hline =3285 \end{array}$$

$$\begin{array}{r} 37. \quad 435 \\ \quad \times 24 \\ \hline \quad 1720 \\ 870 \\ \hline =10420 \end{array}$$

$$\begin{array}{r} 42. \quad =892 \\ 64224 \overline{) 72} \\ \underline{576} \\ 662 \\ \underline{648} \\ 144 \\ \underline{144} \end{array}$$

$$\begin{array}{r} 28. \quad =134 \\ 11193 \overline{) 91} \\ \underline{91} \\ 209 \\ \underline{182} \\ 273 \\ \underline{273} \end{array}$$

$$\begin{array}{r} 33. \quad 314 \\ \quad \times 55 \\ \hline \quad 1570 \\ 1570 \\ \hline =16270 \end{array}$$

$$\begin{array}{r} 38. \quad 856 \\ \quad \times 63 \\ \hline \quad 586 \\ 5136 \\ \hline =51928 \end{array}$$

$$\begin{array}{r} 43. \quad =28 \\ 25488 \overline{) 944} \\ \underline{1888} \\ 6608 \\ \underline{6608} \end{array}$$

$$\begin{array}{r} 29. \quad =76 \\ 44720 \overline{) 520} \\ \underline{4160} \\ 3120 \\ \underline{3120} \end{array}$$

$$\begin{array}{r} 34. \quad 584 \\ \quad \times 65 \\ \hline \quad 2920 \\ 3504 \\ \hline =37960 \end{array}$$

$$\begin{array}{r} 39. \quad 254 \\ \quad \times 872 \\ \hline \quad 508 \\ 1768 \\ \hline =221388 \end{array}$$

$$\begin{array}{r} 44. \quad =282 \\ 9024 \overline{) 32} \\ \underline{64} \\ 262 \\ \underline{256} \\ 64 \\ \underline{64} \end{array}$$

$$\begin{array}{r} 30. \quad =62 \\ 5518 \overline{) 89} \\ \underline{534} \\ 178 \\ \underline{178} \end{array}$$

$$\begin{array}{r} 35. \quad 234 \\ \quad \times 112 \\ \hline \quad 468 \\ 234 \\ \hline =26208 \end{array}$$

$$\begin{array}{r} 40. \quad =570 \\ 40020 \overline{) 69} \\ \underline{345} \\ 552 \\ \underline{552} \\ 0 \end{array}$$

Creative task

Instructions: You are a marketing manager in a new company called "Far Talk". Far Talk is the fourth company in Israel that distributes cellular phones (Their cellular phones developed by "Technocel" - an international corporation located in England). The company is going to launch its first product in Israel in 2001. You have been asked to design the homepage of the company on the Internet. Use the Power Point software to design the homepage.
In front of you is the "Resume" of the company:

Far Talk Company

Technocel Corporation is the only cellular corporation that works with the DNC technology, which is the most advanced technology in the world. On January 1, there will be a declaration of the launch of the first brand of the company in Israel – Far Talk. Technocel who worked many years in England have decided to open a branch in Israel. The CEO of the company in Israel is mister Uri Ben-Sason.

The new building of the company will be located in the Galilee in order to attract young talented people with their families to the Galilee. The company is going out to public with a new evolutionally plan in the areas of prices, service and quality and international calls.

The DNC technology is the most advanced and famous digital technology in the world. More than 331 millions people in the world (above one third of the cellular phones users) are using this technology. This huge amount of users guaranties updated novel technology in the whole world. More than 10 years ago, communication companies, research institutions and government bodies have realized that it is worthwhile to invest in one common technology. In fact, the European governments had encouraged the producers to create one uniform communication standard to facilitate communication between countries.

DNC technology developed as a unique European enterprise but following its tremendous success in Europe it had adopted in the Far East, Middle East, Africa, and now also in the US, Canada and South America. Experts from Technocel Corporation together with cellular communication experts using the experience that have accumulated in the world to establish the new DNC cellular, Far Talk, in Israel.

Technocel Corporation is a public company that traded in the London Burse and the Brand "Far Talk" had so much success in England that it became an international brand in the area of cellular communication. During 1999, this brand was launch in Austria, Belgium, Swiss, Germany, France, India, and Hong-Kong.

The variety of services offered by "Far Talk"

- Identified call – allow you to see who called you.
- Hold call – allow you to hold a call for consultations with a third side, or for decision-making while the other side cannot hear your talking.
- Voice mail – allow you to take care of voice mails. You can send a message to a distributing list, to set priorities and to set the time of launching.
- Conference call – allow you talk with 5 people at the same time.
- Holding call – when receiving a call during a conversation, you will hear a tune and the number of the caller will be presented. Only in Far Talk, you can move easily to the holding call.
- Voice cell – allow you to get a voice messages at any time. A sign that you have a message will appear on the phone screen.
-

- Select calls – allow you to choose for which calls you will be available and when. Even when you are busy, you can be in touch with people who are important to you.
- International calls – allow you to use your cellular while you are abroad with your regular number. All you have to do is to take your cellular with you.

Performance measure of the creative task – Judges' instruction:

Please give a mark between 1 (very bad performance) to 10 (excellence performance), to each one of the following criteria.

1. **The use of the software possibilities** (word-art gallery, special fonts, colors, background, objects, pictures). If using all the mentioned possibilities = 10.

1	2	3	4	5	6	7	8	9	10
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2. Originality of the logo, and the text.

1	2	3	4	5	6	7	8	9	10
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3. Aesthetic (design, colors fitness).

1	2	3	4	5	6	7	8	9	10
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The performance measure was the average the three criteria.